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EXPANDING ALTERNATE WETTING AND DRYING AND IMPROVING ITS PRODUCTIVITY IN IRRIGATED RICE: IDENTIFICATION OF REQUIRED PLANT TRAITS AND SUITABLE SOIL TYPES

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Irrigated rice consumes two to three times more water than other cereals. The availability of water is, however, decreasing and this prompted researchers to find ways in saving water in irrigated rice fields where high yield is critical to ensure food security. The alternate wetting and drying (AWD) technology has been implemented successfully in farmer's fields. What is now needed is to fine-tune this technology in a site-specific manner with regard to genotype characteristics and soil type suitability. Nine genotypes were evaluated in similar growing conditions under AWD30 (irrigation whenever soil water potential reaches -30 kPa). Water productivity increased for all genotypes and a few were identified as adapted through their efficient sink regulation and deep rooting system. Two of the nine classified as promising genotypes were grown in contrasting soil types from sandy loam to clay soil under AWD30 and continuous flooding. Grain yield reduction was higher with the hybrid (37–57% in light soil and 0–7% in heavy soil) than with the inbred (25–45% in light soil and no reduction in heavy soil). Water input under AWD30 was reduced by 29–55% in both genotypes in light soil and by 6–26% in clay soil. Water productivity was higher in heavy soil and reduction in shoot biomass at physiological maturity was stronger in light soil. Stronger reduction in harvest index and sink size was observed with the hybrid. Selecting adapted genotypes and adjusting water management with respect to soil type will further improve the AWD irrigation technology.